

WE CLAIM:

1. A method of lubricating the interface between a container and a moving conveyor surface, in the substantial absence of foamed lubricant and lubricant runoff,
5 the method comprising:
 - (a) forming a continuous thin film of a liquid lubricant composition on a container contact surface of a conveyor; and
 - (b) moving a container on the conveyor surface in order to transport the container from a first location to a second location.
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2. The method of claim 1 wherein the liquid lubricant comprises an emulsion of an organic phase and an aqueous phase.
- 15 3. The method of claim 2 wherein the emulsion contains about 5 to 50 wt% of the aqueous phase.
4. The method of claim 1 wherein the lubricant comprises a suspension of a particulate in a liquid medium.
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5. The method of claim 1 wherein the container comprises an aluminum can or a thermoplastic bottle.
6. The method of claim 1 wherein the liquid lubricant is applied to the
25 surface of the conveyor in an amount of about 2×10^{-4} to 0.05 grams of lubricant per each square inch of surface.
7. The method of claim 1 wherein the thickness of the continuous thin film of lubricant comprises a minimum thickness of an amount sufficient to provide
30 minimum lubricating properties up to about 5 millimeters.

8. The method of claim 5 wherein the thermoplastic bottle comprises a polyethylene terephthalate bottle having a pentaloid base and the area of contact of the lubricant with the bottle is limited to the tips of the pentaloid structure.
- 5 9. The method of claim 1 wherein the method is free of any substantial stress placed on the container for the purpose of changing the shape of the container.
- 10 10. The method of claim 2 wherein the emulsion is a composition stable to phase separation.
11. The method of claim 2 wherein the emulsion is unstable to phase separation after application of the lubricant to the conveyor surface.
- 15 12. The method of claim 1 wherein the coefficient of friction between the container and the conveyor surface is about 0.005 to 0.14.
13. The method of claim 1 wherein the coefficient of friction between the container and the conveyor surface is about 0.01 to 0.14.
- 20 14. The method of claim 1 wherein the coefficient of friction between the container and the conveyor surface is about 0.03 to 0.14.
15. The method of claim 1 wherein the lubricant is applied to the conveyor surface using a brush applicator.
- 25 16. The method of claim 1 wherein the lubricant is applied to the conveyor surface using a spray applicator.
17. The method of claim 1 wherein the container is filled with carbonated beverage and the interior of the container is maintained under substantial pressure.
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18. The method of claim 1 wherein the continuous thin film of the lubricant is placed on the surface of the moving conveyor leaving an unlubricated margin on the conveyor edge.
- 5 19. The method of claim 18 wherein the width of the lubricated area on the conveyor is about 3 to 150 inches.
20. The method of claim 19 wherein the unlubricated margins comprise greater than about 0.5 inches.
- 10 21. The method of claim 1 wherein the conveyor receives about 50 to about 4000 containers per minute.
22. The method of claim 8 wherein contact with the polyester container is limited to no more than 2 millimeters of height from the conveyor surface in contact with the pentaloid lobes in the substantial absence of contact between the lubricant and the body of the container above the lobe area.
- 15 23. The method of claim 3 wherein the emulsion comprises a water in oil emulsion.
- 20 24. The method of claim 3 wherein the emulsion comprises an oil in water emulsion.
- 25 25. The method of claim 3 wherein the oil comprises a hydrocarbon oil, a silicone oil, a triglyceride oil, or mixtures thereof.
26. The method of claim 1 wherein the lubricant comprises a true solution in the absence of a dispersed or suspended phase.
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27. The method of claim 26 wherein the lubricant composition is formed into a thin film undiluted or up to a 5:1 dilution of the water with the lubricant.

28. The method of claim 3 wherein the emulsion comprises a stabilizing
5 surfactant material, a biocide or mixtures thereof.

29. The method of claim 1 wherein the application of lubricant is controlled using a microprocessor controller.

10 30. The method of claim 1 wherein the lubricant composition is formed into a thin film in the absence of an inline dilution of the lubricant.

31. The method of claim 1 wherein the first location is a filling station and the second location is a labeling station.

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32. The method of claim 8 wherein the area of the bottle in contact with the lubricant comprises about 10 to 250mm².

33. The method of claim 1 wherein the thickness of the continuous thin film
20 of lubricant comprises a minimum thickness of an amount sufficient to provide minimum lubricating properties about 0.005 to 0.01 millimeters.

34. The method of claim 1 wherein the thickness of the continuous thin film
of lubricant comprises a minimum thickness of an amount sufficient to provide
25 minimum lubricating properties about 0.0001 to 2 millimeters.

35. The process according to claim 1, further comprising applying a second lubricant to the container or conveyor.

30 36. The process according to claim 1, additionally comprising cleaning said conveyor with a cleaning solution to remove the lubricant.

37. The process of claim 1 wherein the amounts of lubricant run off comprises less than about 1 gram per minute per lineal foot of conveyor.
- 5 38. The process of claim 1 wherein the amounts of lubricant run off comprises less than about 1 gram per hour per lineal foot of conveyor.
39. The process of claim 1 wherein the amounts of lubricant run off comprises less than about 0.1 gram per hour per lineal foot of conveyor.
- 10 40. The method of claim 1 wherein the lubricant composition is formed into a thin film undiluted or up to a 5:1 dilution of the water with the lubricant.
41. A method of lubricating the interface between a container and a moving
15 conveyor surface, in the substantial absence of foamed lubricant and lubricant runoff, the method comprising:
(a) forming a continuous thin film, having a thickness of about 0.0001 to 2 mm, of an emulsion lubricant composition comprising an oil phase and an aqueous phase, on a container contact surface of a conveyor; and
20 (b) moving a container on the conveyor surface in order to transport the container from a first location to a second location.
42. The method of claim 41 wherein the emulsion contains about 5 to 50 wt% of the aqueous phase.
- 25 43. The method of claim 41 wherein the container comprises an aluminum can.
44. The method of claim 41 wherein the container comprises a thermoplastic
30 bottle.

45. The method of claim 41 wherein the liquid lubricant is applied to the surface of the conveyor in an amount of about 0.002 to 0.05 grams of lubricant per each square inch of surface.

5 46. The method of claim 41 wherein the thickness of the continuous thin film of lubricant comprises a minimum thickness of an amount sufficient to provide minimum lubricating properties up to about 2 millimeters.

10 47. The method of claim 44 wherein the thermoplastic bottle comprises a polyethylene terephthalate bottle having a pentaloid base and the area of contact of the lubricant with the bottle is limited to the tips of the pentaloid structure.

15 48. The method of claim 41 wherein the method is free of any substantial stress placed on the container for the purpose of changing the shape of the container.

49. The method of claim 41 wherein the emulsion is a composition stable to phase separation.

20 50. The method of claim 41 wherein the emulsion is unstable to phase separation and after application of the lubricant to the conveyor surface.

51. The method of claim 41 wherein the coefficient of friction between the container and the conveyor surface is about 0.005 to 0.14.

25 52. The method of claim 41 wherein the coefficient of friction between the container and the conveyor surface is about 0.01 to 0.14.

30 53. The method of claim 41 wherein the coefficient of friction between the container and the conveyor surface is about 0.3 to 0.14.

54. The method of claim 41 wherein the lubricant is applied to the conveyor surface using a brush applicator.
55. The method of claim 41 wherein the lubricant is applied to the conveyor surface using a spray applicator.
56. The method of claim 41 wherein the container is filled with carbonated beverage and the interior of the container is maintained under substantial pressure.
57. The method of claim 41 wherein the continuous thin film of the lubricant is placed on the surface of the moving conveyor leaving an unlubricated margin on the conveyor edge.
58. The method of claim 57 wherein the width of the lubricated area on the conveyor is about 3 to 150 inches.
59. The method of claim 19 wherein the unlubricated margins comprise less than about 1 inch.
60. The method of claim 41 wherein the conveyor receives about 50 to about 4000 containers per minute.
61. The method of claim 47 wherein contact with the polyester container is limited to no more than 2 millimeters of height from the conveyor surface in contact with the pentaloid lobes in the substantial absence of contact between the lubricant and the body of the container above the lobe area.
62. The method of claim 41 wherein the oil comprises a hydrocarbon oil, a silicone oil, a triglyceride oil, or mixtures thereof.

63. The method of claim 41 wherein the emulsion comprises an emulsion stabilizing surfactant material.
- 5 64. The method of claim 41 wherein the emulsion comprises a biocide.
65. The method of claim 41 wherein the application of lubricant is controlled using a microprocessor controller.
- 10 66. The method of claim 41 wherein the lubricant composition is formed into a thin film undiluted or up to a 5:1 dilution of the water with the lubricant.
67. The method of claim 41 wherein the first location is a filling station and the second location is a capping station.
- 15 68. The method of claim 47 wherein the area of the bottle in contact with the lubricant comprises about 10 to 250mm².
69. The method of claim 41 wherein the thickness of the continuous thin film of lubricant comprises, a minimum thickness of an amount sufficient to provide minimum lubricating properties, of about 0.0001 to 1 millimeters.
- 20 70. The method of claim 41 wherein the thickness of the continuous thin film of lubricant comprises, a minimum thickness of an amount sufficient to provide minimum lubricating properties, of about 0.005 to 0.01 millimeters.
- 25 71. A process according to claim 41, further comprising applying a second lubricant to the container or conveyor.
72. A process according to claim 41, additionally comprising cleaning said 30 conveyor with a cleaning solution to remove the lubricant.

73. A method of supplying a lubricant, for the method of lubricating the interface between a container and a moving conveyor surface, in the substantial absence of foamed lubricant and lubricant runoff, the method of lubricating comprising forming a continuous thin film of a liquid lubricant composition on a container contact surface of a conveyor; and moving a container on the conveyor surface in order to transport the container from a first location to a second location, said method of supplying comprising:
- (a) forming a lubricating emulsion of an oil and a aqueous phase, and
 - (b) providing the lubricating emulsion to a bottling facility.

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